

WHAT IS CLAIMED IS:

1. A CPP giant magnetoresistive head comprising:  
lower and upper shield layers with a predetermined  
5 shield distance therebetween; and  
a giant magnetoresistive element disposed between the  
upper and lower shield layers and comprising a pinned  
magnetic layer, a free magnetic layer, and a nonmagnetic  
layer disposed between the pinned magnetic layer and the free  
10 magnetic layer, a current flowing perpendicularly to the film  
plane of the giant magnetoresistive element;  
wherein large-area nonmagnetic metal films are provided  
directly above the lower shield layer and below the upper  
shield layer to make direct contact with the pinned magnetic  
15 layer and the free magnetic layer, respectively, of the giant  
magnetoresistive element, and the large-area nonmagnetic  
metal films have larger areas than those of the pinned  
magnetic layer and the free magnetic layer, respectively.
- 20 2. The CPP giant magnetoresistive head according to  
claim 1, wherein each of the lower and upper large-area  
nonmagnetic metal films is formed to a thickness of  $1/4$  or  
more of the shield distance, and the giant magnetoresistive  
element is formed to a thickness of  $3/4$  or less of the shield  
25 distance.
3. The CPP giant magnetoresistive head according to  
claim 2, wherein the thickness of the lower and upper large-

area nonmagnetic metal films is 60 Å to 300 Å.

4. The CPP giant magnetoresistive head according to claim 1, wherein a nonmagnetic metallic material used for forming the large-area nonmagnetic metal films contains at last one element of Au, Ag, Cu, Ru, Rh, Ir, Pd, Ni-Cr, (Ni-Fe)-Cr, and Cr, and when the nonmagnetic metallic material contains Cr, the Cr content exceeds 20 atomic percent.

5. The CPP giant magnetoresistive head according to claim 4, wherein a nonmagnetic metallic material for forming the large-area nonmagnetic metal film formed directly above the lower shield layer comprises Ta/Cu, Ta/Ru/Cu, Ta/Cr, Ta/Ni-Cr, Ta/(Ni-Fe)-Cr, or Cr, and when the nonmagnetic metallic material contains Cr, the Cr content exceeds 20 atomic percent.

6. The CPP giant magnetoresistive head according to claim 1, wherein the pinned magnetic layer extends to the rear of the free magnetic layer and the nonmagnetic layer in the height direction, and the dimension of the pinned magnetic layer in the height direction is larger than that in the track width dimension.

7. The CPP giant magnetoresistive head according to claim 1, further comprising an antiferromagnetic layer provided in the rear of the pinned magnetic layer in the height direction, for pinning the magnetization direction of

the pinned magnetic layer.

8. The CPP giant magnetoresistive head according to claim 1, wherein the pinned magnetic layer extends in the track width direction beyond the free magnetic layer and the nonmagnetic layer, and the giant magnetoresistive element further comprises antiferromagnetic layers provided on both sides of the pinned magnetic layer in the track width direction, for pinning the magnetization direction of the pinned magnetic layer.

9. The CPP giant magnetoresistive head according to claim 1, wherein the pinned magnetic layer has a laminated ferrimagnetic structure comprising a first pinned magnetic layer, a nonmagnetic intermediate layer, and a second pinned magnetic layer, the first pinned magnetic layer extends in the track width direction, and the giant magnetoresistive element further comprises antiferromagnetic layers provided on both sides of the first pinned magnetic layer in the track width direction, for pinning the magnetization direction of the first pinned magnetic layer.

10. The CPP giant magnetoresistive head according to claim 1, wherein the giant magnetoresistive element does not include the antiferromagnetic layer, the pinned magnetic layer comprises a magnetic material having a positive magnetostriction constant or a magnetic material having high coercive force, and the pinned magnetic layer is exposed at

the surface facing the recording medium.

11. The CPP giant magnetoresistive head according to claim 9, wherein part or entirety of the second pinned  
5 magnetic layer comprises Fe-Co-Cu (wherein Fe > 10 atomic percent, Co > 30 atomic percent, and Cu > 5 atomic percent), Fe-Co-Cu-X (wherein X is at least one element of Pt, Pd, Mn, Si, Au, and Ag), or Co<sub>2</sub>MnY (wherein Y is at least one element of Ge, Si, Sn, and Al).

10

12. The CPP giant magnetoresistive head according to claim 1, wherein part or entirety of the free magnetic layer comprises Fe-Co-Cu (wherein Fe > 10 atomic percent, Co > 30 atomic percent, and Cu > 5 atomic percent), Fe-Co-Cu-X  
15 (wherein X is at least one element of Pt, Pd, Mn, Si, Au, and Ag), or Co<sub>2</sub>MnY (wherein Y is at least one element of Ge, Si, Sn, and Al).

13. The CPP giant magnetoresistive head according to  
20 claim 1, further comprising hard bias layers provided on both sides of the giant magnetoresistive element and between the large-area nonmagnetic metal films, and an insulating layer filling in each of the spaces between the hard bias layers and the large-area nonmagnetic metal films.